# Forests, Livelihoods and Coping strategies to Climate variability: the case of southern Cameroon

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# Background

- Increasing role of **forest ecosystem goods** and **services** (FEGS) in local **livelihoods**
  - NTFPs as food sources
  - Fuelwood to meet energy demands
  - Herbs for medicinal purposes
  - Additional income from NTFP trade
  - Soil and water conservation





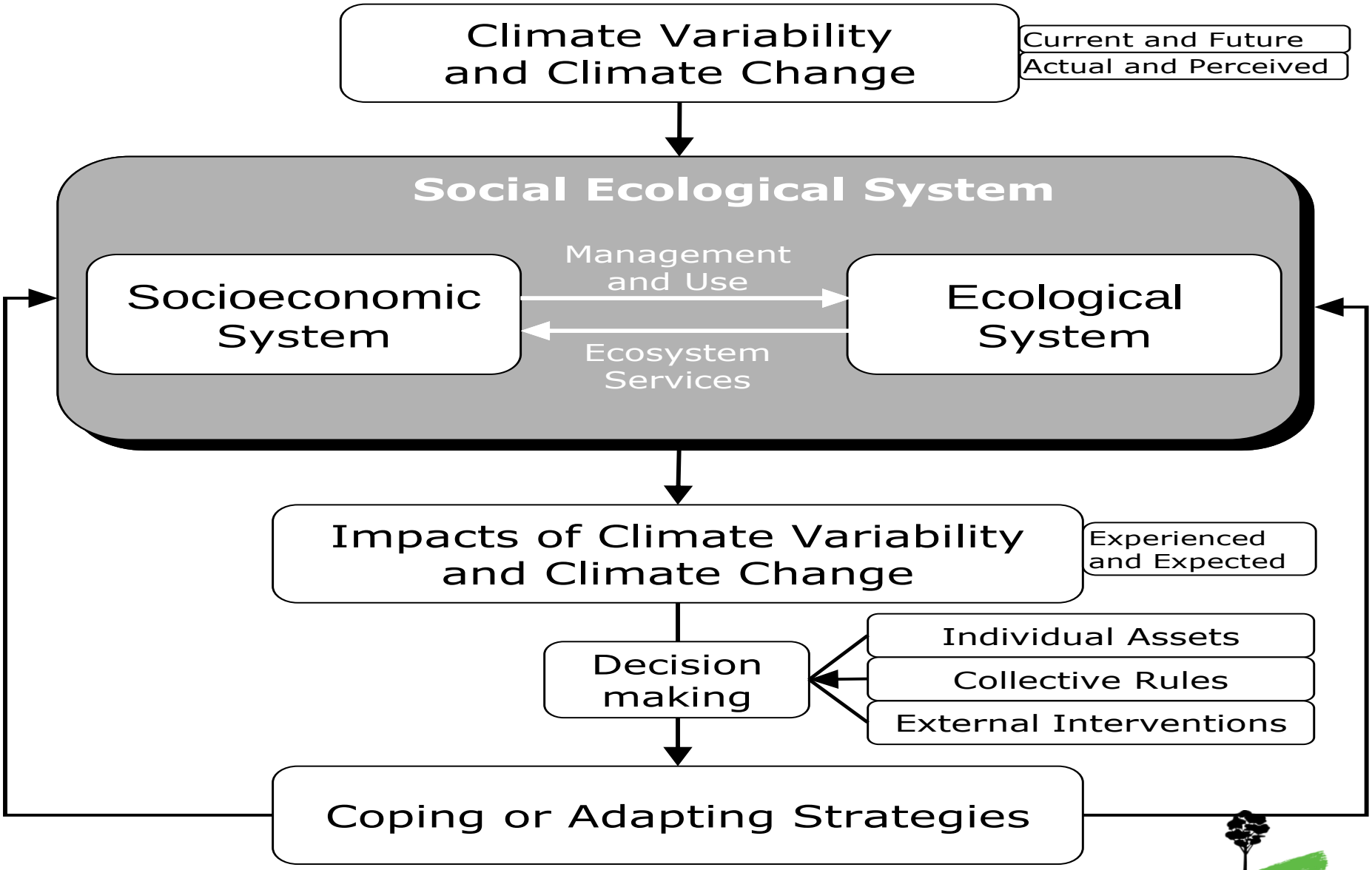
# Background

- Impacts of climate variability and change on ecosystems including forests
  - Changing patterns of temperature and rainfall
- Resulting impact on forest-dependent communities
  - Because they depend on ecosystem goods and services
- In response, local communities have developed a range of coping strategies
  - Reducing vulnerability
  - Increasing adaptive capacity

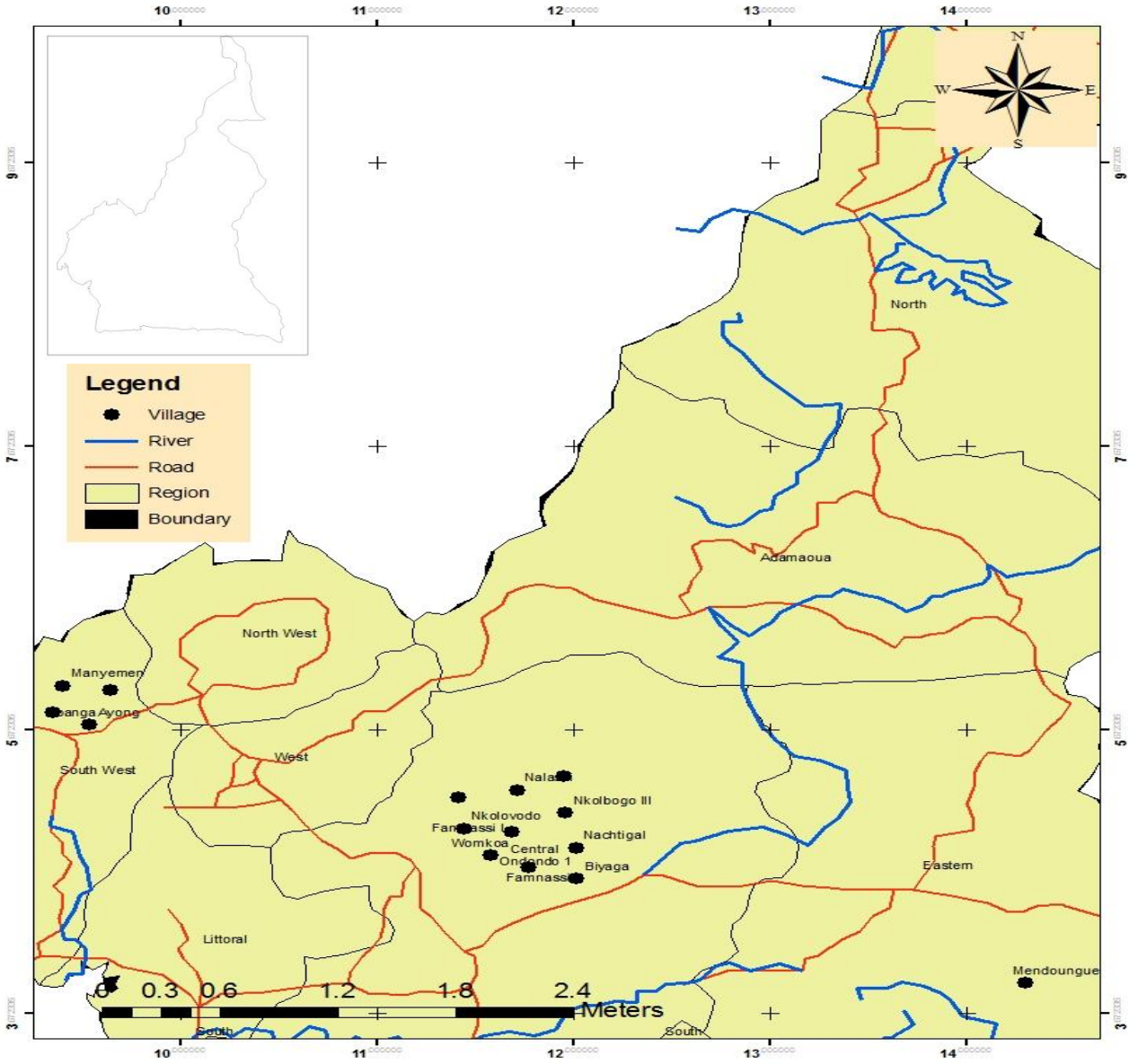
# Research Question

How does households' use of forest resources contribute to their coping strategies to deal with climate risks?

# Conceptual Framework



# Study context – southern Cameroon

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# Methodology

- Household survey
  - 120 households
  - 3 regions within southern Cameroon
    - Central *(n= 40)*
    - East *(n = 35)*
    - West *(n = 45)*
  - 14 villages in total
  - 10-12% of total HHs in the villages surveyed
- Data on:
  - Household socio-economic characteristics
  - Local perception of climate impacts
  - Dependency on forest resources
  - Local Coping Strategies

# Forest dependency for food

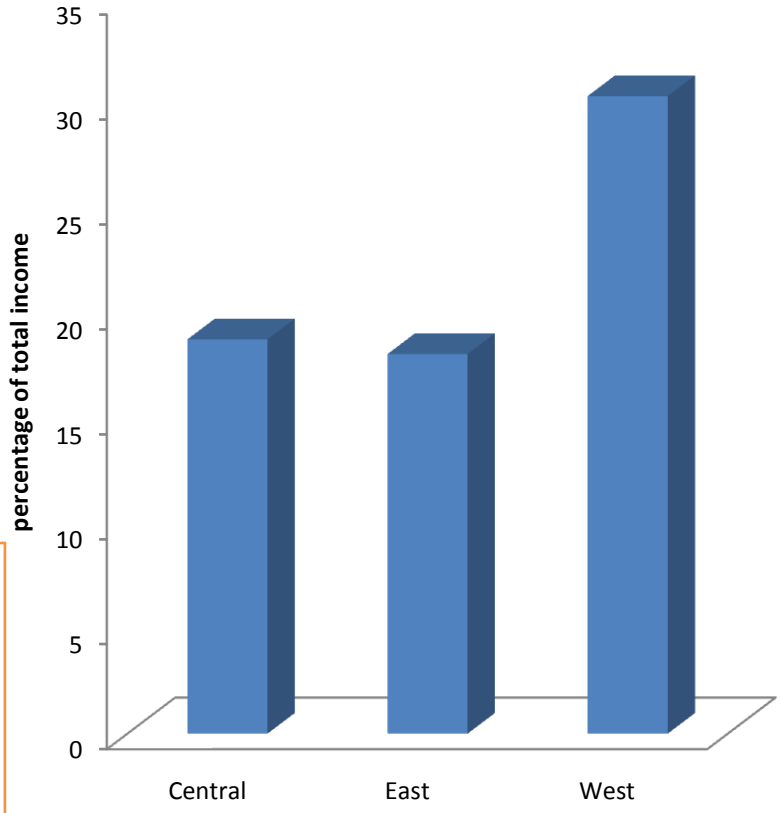
- 21 different NTFPs collected
- 70% for household consumption and dietary needs
- Collected NTFPs mainly food-based

**10 most significant NTFPs collected**

| Scientific name | Common name(s) | Use category | Region |
|---|---|---|---|
| *Gnetum africanum* | Okok | Food | East= Central > West |
| *Garcinia cola* | Bitter Kola | Food and health | West > East |
| *Ricinodendron heudelotii* | Ezezang, Djanssang | Food | Central > East > West |
| *Irvingia gabonensis* | Bush mango | Food | Central > East > West |
| *Afromomum danielli* | Mbong, Ndong | Food and health | East> Central |
| *Cola nitida* | Cola | Food | Central> East > West |
| *Apostiraxle pidophyllus* | Bush onion | Food | West |
| *Lacosperma secundiflorum* | Rattan | Construction material | West> Central > Eeast |
| *Baillonela toxisperma* | Djabè | Food | West |
| *Maranthacée spp* | Maranthacée | Food | Central > East > West |

# Forest dependency for income

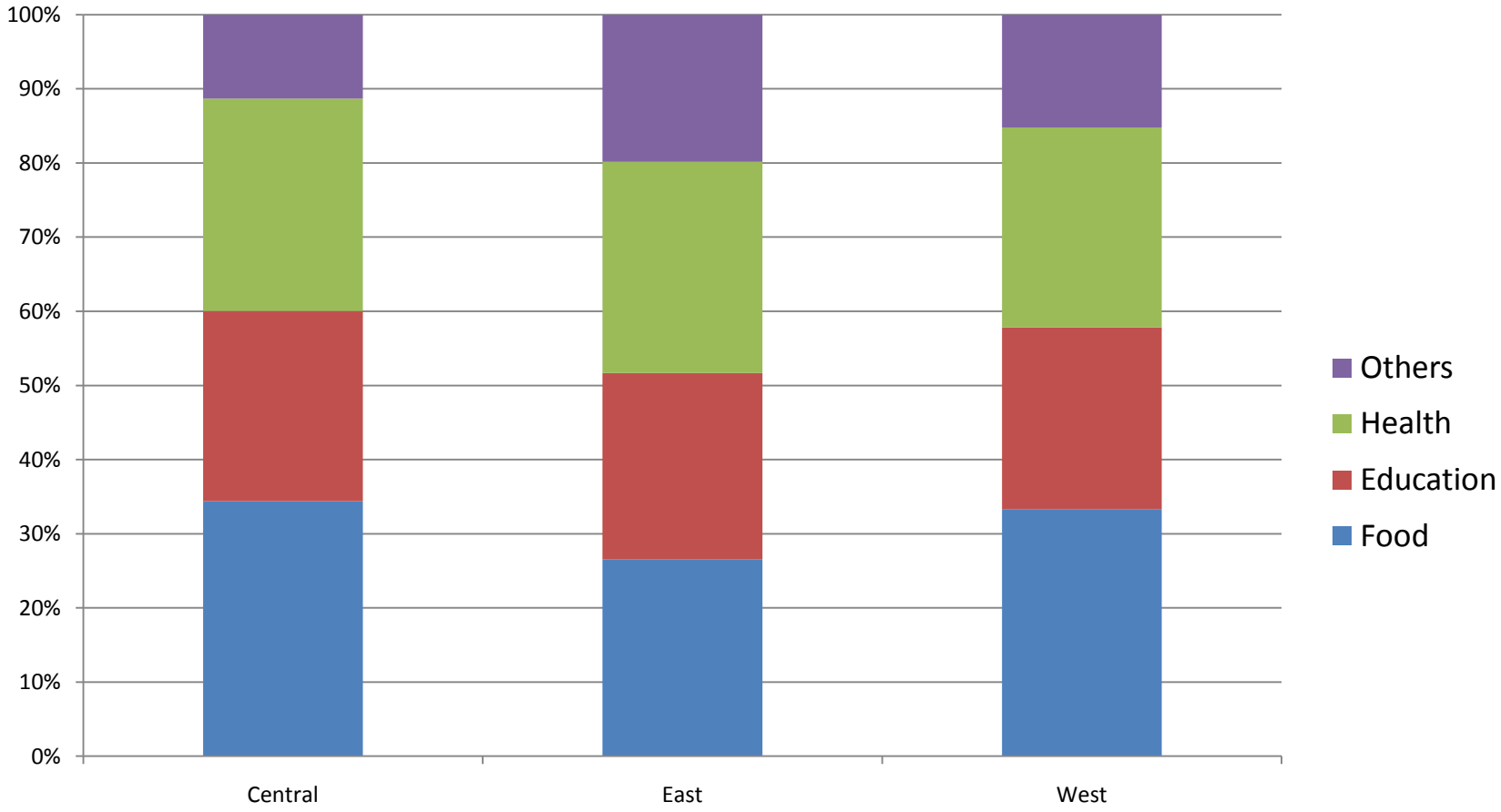
- Forest-based income is 18-30% of total HH income
- Up to $500/yr could be generated from NTFP trade




| Income sources | CENTRAL | EAST | WEST |
|---|---|---|---|
| Forest-based income (CFA) | 141 940 | 142 085 | 258 400 |
| Non forest based income | 613 060 | 642 915 | 591 600 |
| Percentage (%) | **18.8** | **18.1** | **30.4** |

**1 USD = 500 CFA**

# Household distribution of total income



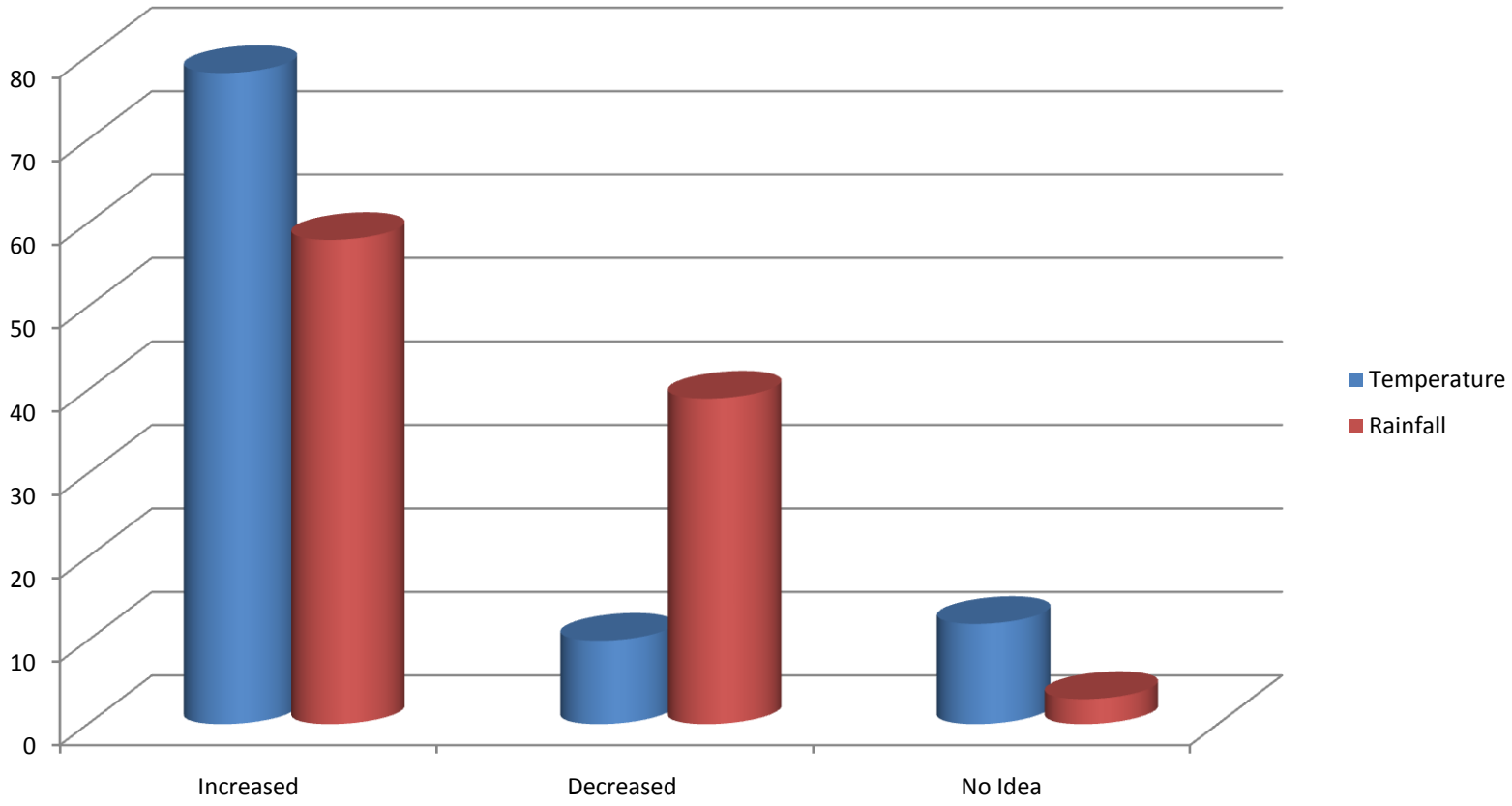
# Household Xteristics and Forest dependency

| Variable | Summary statistics | | Logit regression results | | |
|---|---|---|---|---|---|
| | Mean | Std. Deviation | Coefficient | Robust std. error | Marginal effect |
| **Constant** | - | - | 0.974 | 1.517 | - |
| **Gender** | 1.408 | 0.510 | 1.851* | 0.980 | 0.140 |
| **Age** | 52.650 | 13.100 | -2.023** | 0.733 | -0.153 |
| **Religion** | 1.958 | 0.973 | -0.607* | 0.293 | -0.005 |
| **Household Origin** | 1.300 | 0.616 | -0.038 | 0.837 | -0.003 |
| **Education level** | 1.683 | 1.122 | 0.103 | 0.359 | 0.008 |
| **Number of dependants** | 10.008 | 5.215 | -0.910 | 0.580 | -0.069 |
| **Access to forests** | 1.091 | 0.916 | -2.147* | 0.864 | -0.163 |
| **Size of the forests** | 2.512 | 1.156 | 0.038 | 0.401 | 0.003 |
| **Forest resource use** | 2.800 | 1.590 | 2.433** | 0.507 | 0.184 |
| **Non-forest based income** | 607458.5 | 704092 | 3.51e-07 | 4.64e-07 | 4.10e-08 |

*implies significance at 5%; ** implies significance at 10%

# Local perception of climate risks

- Perception of rural households on climate variability and change (last 15 years)



# Local Coping Strategies

| Coping/Adaptive strategy | Frequency | | Broader sector where the strategy takes place | Anticipatory or Reactive strategy |
|---|---|---|---|---|
| | N | % | | |
| Change in collection sites of NTFPs | 12 | 6.8 | Forest | Reactive |
| Shift in sowing time | 24 | 13.6 | Agriculture | Both |
| Animal husbandry | 69 | 39.2 | Agriculture | Both |
| Multiple sowing | 6 | 3.4 | Agriculture | Reactive |
| Modification of treatment method | 19 | 10.8 | Agriculture | Reactive |
| Use of improved varieties | 6 | 3.4 | Agriculture, Forest | Anticipatory |
| Modification of NTFP use system | 29 | 16.5 | Forest | Both |
| Modification of cultivation system | 3 | 1.7 | Agriculture | Reactive |
| Irrigation | 1 | 0.6 | Agriculture | Reactive |
| Fallow | 2 | 1.2 | Agriculture | Reactive |
| Getting paid jobs | 5 | 2.8 | Off farm | Reactive |

# Household Xteristics and Coping Strategies

| Variable | Coping Strategies | | | |
|---|---|---|---|---|
| | Animal husbandry | Shift in sowing time | Modification of crops treatment method | Modification of NTFP use system |
| | Coefficients | Coefficients | Coefficients | Coefficients |
| Gender | -0.804 | 0.285 | -2.234* | -0.245 |
| Age | 0.003 | 0.003 | 0.013 | -0.011 |
| Religion | -0.330 | -0.008 | 0.100 | 0.637* |
| Household Origin | -1.587 | 0.073 | 1.722* | 0.357 |
| Education level | -0.366 | -0.431 | 0.305 | 0.188 |
| Household size | 0.285* | 0.030 | 0.025 | -0.020 |
| Access to forests | 0 | 0.644 | 0.479 | -0.303 |
| Average forest size | -0.989** | 0.236 | 0.088 | 0.375 |
| Forest-based income | 3.79e-06 | -1.07e-06 | -1.26e-06 | -1.38e-06 |
| Non-forest based income | 4.11e-06 | 6.11e-07* | 1.48e-07 | -1.93e-06* |
| Constant | 4.479 | -2.599 | -2.844* | -1.735 |

*implies significance at 5%; ** implies significance at 10%

# Conclusion

- Forest provides natural insurance/safety nets for local response to climate risks
- Food security and Income generation target poverty reduction and reducing vulnerability
- Household characteristics influence adaptive capacity and adaptation outcomes
- Future increasing role of forest to support adaptation to climate variability and change

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